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profusely filled with plants thrown up from the creeping stolons. This gave an average of about three-fourths of an inch of growth per day; equal to maize or other rapid-growing vegetation above ground.

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JUNE 9.

Prof. JOS. LEIDY in the chair.

Sixteen members present.

Prof. PERSIFOR FRAZER, Jr., made the following remarks:—

During a recent trip to Missouri I had an opportunity of visiting and personally examining the Pilot Knob, and Iron Mountain, and Mine La Motte districts, in company with two of the assistant geologists—Prof. Potter and Mr. Gage. There is much in this district, and in fact in most parts of Missouri, to interest the student of geology from east of the Alleghanies: for example, the variations in the character of the porphyry, which is the archæan according to Prof. Pumpelly, or the azoic member of the Missouri series. This porphyry carries several deposits of ore, both veins and beds, as has been ably pointed out in the recent geological survey of the State by Prof. Pumpelly. This, and the magnesian limestones which overlies it, form the principal part of the surface in the southeastern part of the State.

Mine La Motte is situated in St. Francois County, about ninety miles nearly due south of St. Louis. There are extensive works put up on this property, and the whole was sold to an English company two years ago for \$3,000,000, but the sale could not be ratified owing to a law of Missouri which prohibits foreigners from holding property in that State. At least such was the information given to me. The deposits of lead and copper and nickel ores at Mine La Motte, part of a great belt about one hundred miles wide which crosses the State from southeast to northwest, lie in the limestone. At Mine La Motte there is a profuse occurrence of nickel-bearing minerals, and especially of millerite, which is found in stellate, acicular, and radial crystals on the surface of many of the lumps of ore.

The works here, before they were burned down, treated the ores in open American hearths, and brought out matt which was shipped to Swansea. It is said, on competent authority, that a galena exhibiting a peculiar blue color (like that found on the surface of much peacock ore), contains cobalt. The cause of this color, and also its connection with the contained metal, are not perfectly understood. Almost all of the galena of the district is colored in this way.

I present also specimens of iron ore from Iron Mountain, Missouri, where it occurs in irregular veins, intersecting the por-

phyry mountain in all directions. This mountain covers at its base about seventy acres, more or less, and is furrowed by deep cuts near its summit; some of these to a depth of eighty to one hundred feet. The best and purest ore is that which was found lying on the surface of its slopes, and of this there is still a very large quantity; but the large boulders have been almost all removed, while that which remains is so finely divided and so mixed with the clay and soil that any ordinary method of separation would make it too expensive.

Lately, the California hydraulic mining has been applied to win this ore, with great success. Water is pumped through large hoses which are led up the sides of the hills, and the debris is washed down through sluice-boxes and over small falls, which agitate it sufficiently to shake the ore from the dirt and allow it to deposit at the foot of the hill by virtue of its higher specific gravity, in receptacles provided for it. The remaining ore is obtained by blasting, is loaded on a gravity railway and carried to the foot of the mountain, where it is dumped, three or four tons at a time, over a shoot which precipitates it some eight or ten feet, upon the flats of the Iron Mountain Railroad Company, which are awaiting it. The shock as this heavy weight strikes the cars is great enough to cause them sometimes to tilt over on two wheels. How much it increases the wear and tear I was unable to ascertain.

This ore contains from 65 to 68 per cent. metallic iron, associated with 0.031 per cent. to 0.11 per cent. phosphorus and 4 to 4.5 per cent. silica, and a trace of sulphur. The quantity exposed is enormous, but was stated by Mr. David Thomas, of Catasauqua, not to equal in quantity the celebrated Cornwall mines of this State.

The ore from Pilot Knob is much more sandy than that from Iron Mountain. It occurs in a bed dipping with the general dip of the country rock, and inclosed within the porphyry out of which the knob is formed. The formation of this ore is a most interesting study, and the only plausible theory seems to be that of lateral replacement, a case of metasomatism where the porphyry, having become slaty in structure, and less capable of resisting the solvent, has been replaced along the line of strike, and only in such laminated parts. This ore is banded in appearance, and is almost, if not quite, invariably hematite.

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#### JUNE 16.

The President, Dr. RUSCHENBERGER, in the chair.

Twenty-five members present.

*Notice of some Fresh-water and Terrestrial Rhizopods.*—Prof. LEIDY stated that among the amœboid forms noticed by him in